**From:** "Martin, Michael T." <mt.martin@ngc.com>
**To:** "Schulz, Norbert (BBL)" <NSCHULZ@bbl-inc.com>
**Date:** 11/8/2004 12:08:27 PM
**Subject:** RE: Y-12 cost reduction summary

Norbert,

Welcome to the new job! Please provide a spreadsheet to reflect the proposed cost breakdown and savings from our current most probable of $1.4MM. See attachment.

Mike

-----Original Message-----
From: Martin, Michael T.
Sent: Friday, October 29, 2004 2:37 PM
To: Haltmeyer, Tim
Cc: Norbert Schulz (E-mail); Brown, Elizabeth C. (Law)
Subject: FW: Y-12 cost reduction summary

There is some room for a demonstrated cost savings here since our current probable future cost is $1.4MM. So that makes a$450K savings, assuming the $720K remediation and $230K negotiation/monitoring costs estimated by Norbert. We could only propose more if we wanted to rebaseline the probable cost. $450K seems like a good benefit from our SWAT review.

Mike

NORTHROP GRUMMAN CORPORATION
COST REDUCTION/AVOIDANCE DOCUMENTATION AND VERIFICATION
ENVIRONMENTAL REMEDIATION PROGRAM

PART I: PROGRAM INFORMATION

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|---|---|
| Initiative | TERRA Portfolio Life Cycle Cost Reduction |
| Project | Anaheim — Former Y-12 Facility |
| Project Manager | Michael Martin |
| Date Submitted | November 2004 |

PART II: COST REDUCTION/AVOIDANCE (PLEASE CHECK & COMPLETE ONE BLOCK ONLY)

| COST SAVINGS[1] | | TOTAL AMOUNT |
|---|---|---|
| ☐ | This year only | |
| ☒ | This year & future years | $450,000 |

PART III: SUPPORTING INFORMATION (USE ADDITIONAL SHEETS IF NECESSARY)

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| Background: | Northrop Grumman Aircraft Division manufactured aircraft parts at the former Y-12 facility between 1962 and 1994. Activities in the Y-12 facility included vapor degreasing, metal quenching, painting and treatment of aircraft parts. The site was sold in 1996 and is operated by the new owner as an automotive products packaging and storage facility. Before selling the property, NGSC conducted an investigation of soil conditions and performed limited soil remediation of petroleum compounds, metals and VOCs. In 1995 the California Regional Water Quality Control Board, Santa Ana Region (RWQCB) issued a "no further action" letter for the soil remediation performed at specific locations within the former Y-12 facility.<br>The former Y-12 facility is located in the downgradient portion of a regional groundwater contamination plume within the Santa Ana Forebay Groundwater Subbasin as identified by the Orange County Water District (OCWD). As a result of their study, the OCWD has identified an area of groundwater containing chlorinated VOCs that encompasses several square miles. These VOCs occur primarily in the shallowest water-bearing zones that occur within approximately 250 feet of the ground surface. VOCs are also present in deeper aquifers and have impacted certain municipal supply wells.<br>ESH&M has been evaluating the groundwater in the vicinity of and downgradient of the site since 1996, installing 17 groundwater-monitoring wells at the direction of the RWQCB. Seven wells have been installed in an upper perched zone, 8 in the upper aquifer at approximately 120 feet, and 2 deep wells at approximately 190 feet. The final three wells were installed in June 2004 in compliance with a Cleanup and Abatement Order, issued in November 2003. In a July 2004 letter, the RWQCB concluded that no further investigations downgradient of the Y-12 facility were necessary and directed NGSC to formulate a plan for groundwater remediation. |

[1] If possible, cost savings should be reflected in a change in life cycle cost estimate at next reserve review. Please attach copy of before-and-after estimates to support the proposed savings.

| | |
|---|---|
| Cost Reduction Activity(ies): | ESH&M held a SWAT event in September 2004 to validate the site management strategy and remediation plan for submittal to the RWQCB. The remediation plan, including a conceptual site model, a remedial alternatives evaluation, and a pilot study proposal was submitted to RWQCB in October. The recommendations included a focus on remediation of residual contamination within the vadose and shallow perched groundwater zones beneath the facility in order to mitigate potential contributions to the regional contamination in the upper aquifer. This cost avoidance has been evaluated using this plan and the recommendations of the SWAT participants. Additional cost reductions could be realized by reducing the number of wells and the frequency of monitoring over the next 10 years. |
| Facts & Assumptions Used in Calculations: | 1. The primary source areas for VOC contamination at the site are the former quench tank and vapor degreasing areas. Secondary source areas are the waste management area and the former TCA tank area. Constituents of concern related to the former facility include TCE; 1,1,1-TCA; and their breakdown/transformation products.<br>2. Soil conditions are not fully delineated at the site; residual contamination is present above the perched layer, likely related to former site activities.<br>3. While the potential contribution from the site to the shallower zone of the upper aquifer is not sufficiently investigated, contamination in the deeper zoneis a regional problem unrelated to the site. Additionally, groundwater conditions upgradient of the site require further investigation.<br>4. The SWAT recommendation for SVE with dual phase extraction will be implemented as the remedial alternative. A pilot study will be performed, followed by final design, installation, and two years of operation.<br>5. Additional pre-design investigation of the upper perched and vadose zone is required.<br>6. Groundwater monitoring of 17 wells is currently performed quarterly. The monitoring frequency will be reduced to semi-annual following concurrence from the RWQCB.<br>7. A demonstration of "no contribution" to regional contamination will be required to avoid becoming involved in a regional cost-sharing situation.. |
| Detailed Calculation (resulting in $ listed in Part II): | Cost Reduction =<br>▪ 2004 TERRA baseline most probable cost (a) = $1,400,000<br>▪ Cost for proposed vadose/perched groundwater zone remediation (b) = $720,000<br>▪ Cost for agency negotiation, semi-annual groundwater monitoring for 10 years (c) = $230,000<br>▪ Net cost reduction (a) – (b) – (c) = $450,000 |

## PART IV: SIGNATURES

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|---|---|
| Submitted By/Date | Verified By/Date |

| Cost Reduction | Previous Est. | Revised Est. | NGC Costs | Cost Savings |
|---|---|---|---|---|
| Future Site Remediation Costs | N/A | $1,400,000 | $0 | |
| | | | | |
| SVE Pilot Study | | | $50,000 | |
| Pre-design Investigation | | | $100,000 | |
| Full-scale Design | | | $25,000 | |
| Equipment Capital Costs | | | $75,000 | |
| Full-scale System Installation | | | $250,000 | |
| 24 month operation Costs | | | $200,000 | |
| System Decommissioning | | | $20,000 | |
| Groundwater monitoring (semi-annual) 10 years | | | $200,000 | |
| Consultant Support for Agreement | | | $30,000 | |
| | | Subtotal | $950,000 | |
| **Total Savings** | | | | $450,000 |